

MANAGEMENT OF FOURNIER'S GANGRENE: EXPERIENCE OF TWO TERTIARY CARE HOSPITALS IN SINDH, PAKISTAN

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ABSTRACT

OBJECTIVE: Health negligence is common in our society. Minor injuries and infections of genitalias can lead to life threatening disorders. The aim of this study was to draw attention towards early diagnosis and appropriate management of Fournier's gangrene.

DESIGN: Descriptive study.

SETTING: Departments of Surgery, Liaquat University Hospital Hyderabad (from June 2000 to May 2001) and Mohammad Medical College Hospital Mirpurkhas (from April 2002 to March 2003).

PATIENTS AND METHODS: Total 18 patients were admitted and treated for Fournier's gangrene. Surgical procedures adopted were early wide debridement and later reconstruction.

RESULTS: Male remained dominant victim of the disease (88.8%). Average age of patients was 43 years. Urinary tract infection was the commonest etiological factor (44.4%). Mortality was 5.27%. Wide surgical debridement was the first option used for the management. Thirty three percent cases required one stage closure of wound after healthy granulation. More advanced procedures were adopted in others.

CONCLUSION: Fournier's gangrene is a notorious disorder which requires early diagnosis and aggressive treatment. Minor infection should be given due attention as negligence may lead to this life threatening condition.

KEY WORDS: *Fournier's Gangrene. Surgery. Reconstruction. Antibiotics.*

INTRODUCTION

Fournier's gangrene is defined as a polymicrobial necrotizing fasciitis of the perineal, perianal, or genital area. Jean Alfred Fournier, a French venereologist in 1883, described a series in which five previously healthy young men suffered from a rapidly progressive gangrene of the penis and scrotum without apparent cause¹. If not recognized early, this infectious process will extend along the fascial plane to the lower abdominal and back region causing severe morbidity and even mortality^{2,3}. It is not limited either to young individuals or to males and the cause of infection can usually be identified⁴. Females are less commonly affected than males, and their reported incidence is 14%² while children are even less commonly affected^{4,5}. The ultimate sources of the invasive infection can often be localized to the colorectal or genitourinary tracts⁴.

Fournier's gangrene has also been reported as a result of rectal and genitourinary trauma, following instrument and surgical procedures. In females causes may be septic abortion or vulval or bartholin's gland abscesses⁶. Pediatric groups may suffer following circumcision, burns, perineal disease and systemic infections. Co-morbid diseases like diabetes mellitus, alcoholism, advanced age, malignancy,

steroid therapy and malnutrition may be associated with or rather potentiate the Fournier's gangrene^{4,6}. There have also been reported few cases of Fournier's gangrene in patients suffering from AIDS⁷⁻¹⁰. Fournier's gangrene is a true surgical emergency that is rapidly progressive and potentially lethal³. Patient should be prepared for urgent surgical interventions with aggressive resuscitation and high dose parenteral antibiotics¹¹. Wide debridement is required and repeated trips to the operating room for the same purpose are often needed. Fluid and electrolyte deficit need to be corrected. Broad spectrum antibiotics should be initiated as soon as possible¹². In the next step reconstruction using various modalities can be done^{13,14}.

This study was carried out to draw attention towards the early diagnosis and appropriate management of Fournier's gangrene.

PATIENTS AND METHODS

This study was carried out at the Department of Surgery (Unit-I), Liaquat University Hospital Hyderabad from 1st June 2000 to May 2001 and Department of Surgery, Mohammad Medical College Mirpurkhas from April 2002 to March 2003. Patients of all ages and sex group were included in the study. Twelve patients were admitted and operated with

signs and symptoms of Fournier's gangrene at Liaquat University Hospital and six at Muhammad Medical College Hospital, Mirpurkhas. Epidemiological data was recorded on a proforma after taking consent. The diagnosis was made on the basis of history and physical examination which included erythematous, oedematous cyanotic perineal, scrotal and penile skin with blisters in few cases and gangrene in some. Baseline investigations including Blood CP, Urine DR, Blood Urea, Blood Sugar Random and Serum electrolytes were carried out in all cases. Patients were resuscitated with broad spectrum antibiotics, ringer, colloid or blood transfusion, as the patients condition warranted. The operation was performed as soon as hemodynamic stability was achieved. Wide debridement was done by washing wound with povidone iodine, hydrogen peroxide and normal saline. Suprapubic cystostomy was done in only two cases who had extensive perineal and penile involvement. In remaining cases, perurethral catheterization was done. As infection was controlled and healthy granulation tissue developed, reconstruction proceeded after two weeks. Reconstruction ranged from simple covering the raw area after undermining the neighboring skin to partial thickness skin grafting, flap reconstruction and urethroplasty.

RESULTS

All 18 cases were diagnosed clinically on gross findings. There were 16 male and 2 female patients with ratio of 8:1. Age of patients varied from 25 to 60 years with average 43 years. As for as etiology is concerned, out of total 18 patients, 10 had urinary tract problems for which they had irregular treatment history. Of these 10, 8 had urinary tract infection while 2 had history of prostatic surgery; transurethral resection of prostate/transvesical prostatectomy a year back. These two patients were also suffering from narrow urinary stream and straining during micturition for six and four months respectively (**Figure 1**). Four patients had history of trauma, one by cricket ball and 3 by road traffic accident. They sustained injury over scrotum and had neglected the wound. Two patients had history of boil on scrotum, for which they had applied ointment provided by "Hakim". Two female patients had history of still birth and home delivery followed by development of blebs on perineum, which in few days extended widely involving anterior abdominal wall and medial aspect of thigh including labias (**Table I**). Two patients were diabetic with random blood sugar 289 mg/dl and 310 mg/dl respectively. Three patients had anaemia. Two males had haemoglobin (Hb) 8 gm/dl and 8.5 gm/dl while a female patient had 7 gm/dl respectively.

Remaining patients had Hb more than 10 gm/dl. Resuscitation was done with intravenous line and injectable antibiotics in combination of C. Penicillin, Metronidazole and Gentamycin. Wide debridement was done under general anaesthesia and scrotal swabs were taken for culture and sensitivity. All necrotic tissues were removed and wound packed with povidone iodine soaked gauzes. Diabetes was controlled through insulin. Healthy granulation occurred from two to six weeks time (Average 3 weeks). By this time, definite procedure was proceeded. Skin undermining with primary closure was done in 06 patients (33%). Three patients required this closure in two stages (22.22%). Two patients required suprapubic cystostomy due to extensive involvement of penile skin in one patient while other had post prostatectomy urethral stricture. In these 4 patients, skin flap from thigh was also used for reconstruction of scrotum (22.22%). Patient with urethral stricture was later on referred to urology department for stricturoplasty. Three patients (22.22%), 2 male and one female had more extensive involvement and required partial thickness skin grafting (**Table II**). Mortality remained one in this study. Thirteen patients attended regular follow up while four patients were lost after 2nd stage procedure. Graft was accepted well. Only complication in the form of wound infection was seen in one patient, in whom skin undermining and primary closure were adopted. Infection was in the form of a pusy discharging sinus at corner of closure near to anus. It responded well to local therapy which included curettage and sitz baths. Overall outcome remained extremely good as seventeen patients survived with acceptable reconstructive work.

TABLE I:
ETIOLOGICAL FACTORS AMONG PATIENTS OF
FOURNIER'S GANGRENE

Etiological Factor	No. of Patients	Male	Female	Percentage
Urinary tract infection	08	08	-	44.44
Post Transvesical prostatectomy / urethral stricture	02	02	-	11.11
Trauma	04	04	-	22.22
Boil over scrotum	02	02	-	11.11
Stillbirth	01	-	01	5.55
Home delivery (perineal sepsis)	01	-	01	5.55

TABLE II:
PROCEDURES ADOPTED FOR MANAGEMENT OF
FOURNIER'S GANGRENE

Procedure	No. of Patients	Male	Female	Percentage
One stage wound closure	06	06	-	33.33
Two stage wound closure	04	04	-	22.22
Skin flaps from thigh	04	04	-	22.22
Partial thickness skin grafting	03	01	01	16.66
Patient expired after primary debridement	01	-	01	5.55

FIGURE I: PRESENTATION OF A PATIENT WITH
FOURNIER'S GANGRENE



DISCUSSION

Fournier's gangrene is relatively uncommon and true incidence of the disease is unknown. An average of 97 cases per year has been reported from USA during 1989-1998¹⁵. In this study, 18 cases have been collected during 2 years. The reported mortality rate from Fournier's gangrene varies widely from 4%-75%¹⁶. Death usually results from systemic illness such as sepsis, coagulopathy, acute renal failure, diabetic ketoacidosis or multiple organ failure¹⁶. In current study, mortality remained 5.55%. Reported male to female ratio is 10:1² which is similar to our study that is 8:1. Lower incidence in females may be caused by

better drainage of the perineal region through vaginal secretions¹⁷. Most reported cases occur in age range of 30-60 years¹⁸. In this study, age varied from 25-60 years with average 43 years. Patients usually come late by 5-7 days to the hospital after the onset of initial symptoms¹⁹. Early in the course of this disease, pain may be out of proportion to physical findings. Swelling and erythema of the region follows pain and patients may complain of systemic symptoms such as fever or chills. As gangrene develops, pain actually may subside as nerve tissue becomes necrotic²⁰. Skin overlying the affected region may be normal, erythematous, oedematous cyanotic, bronzed, indurated, blistered and or frankly gangrenous. Idiopathic cases still are reported, but causative factors are found in more than 75% of patients²¹. Localized infection adjacent to the portal of entry is the inciting event in the development of Fournier's gangrene. Colorectal, genitourinary and dermatological sources are implicated in the pathogenesis of the disease example^{22,23}. Causative factors in this study include urinary tract infection, trauma, boil, still birth, home delivery and perineal sepsis which are comparable with literature²⁰. Causative microbes isolated in wound culture from patients with Fournier's gangrene reveal this a polymicrobial infection with an average of 4 isolates per case¹². E coli is the predominant aerobe, and bacteroid is the predominant anaerobe¹². Because of non availability of anaerobic culture, microorganisms isolated in this study remained E.coli and streptococcus. Other common microflora include proteus, staphylococcus, enterococcus, aerobic and anaerobic streptococcus, pseudomonas, klebsiella and clostridium²³. Alongwith baseline investigations, CT scan can be helpful in diagnosing hidden ischio-rectal abscess²⁴⁻²⁶. Or, histopathology, necrosis of the superficial and deep fascial planes, fibrinoid coagulation of the nutrient arterioles and polymorphonuclear cells infiltration are constant findings. Microorganisms can also be identified within the involved tissue²⁷. The characteristic finding, which most commonly indicates Fournier's disease is the fibrinoid thrombosis of the nutrient vessels that supply the superficial and deep fascia²⁸. Once the diagnosis is established, all necrotic tissue must be excised. The skin should be opened widely to expose full extent of the underlying fascial and subcutaneous tissue necrosis²³. Given the potential fulminant nature of this necrotizing process, repeated operative debridement procedures should be considered to assess complete eradication of the infection. Use of hyperbaric oxygen therapy for the control of anaerobic infections is also mentioned in literature²⁹. If the perineal involvement is extensive fecal diversions

should be entertained at subsequent operative exploration to eliminate the potential for fecal contamination of the wound²². But none of our case required this diversion. Urinary diversion is accomplished which is urethral catheter in most instances. Suprapubic cystostomy is utilized when urethral drainage of the bladder is not possible due to pathology e.g. stricture, prostatic hypertrophy. The testicles are often spared in the necrotic process⁴ and the exposed testes in this study were kept in a subcutaneous pocket to prevent desiccation. If these are involved in the necrotic process or their viability is questioned, orchidectomy can be performed⁴. Regular dressings are required either using Neomycin spray or povidone iodine soaked gauzes. Once the infection is eradicated, healthy granulation tissue will develop that signifies the time to proceed to reconstruction³⁰. Way of dressing in this study was same as mentioned in literature¹¹. Primary closure of skin, local skin flap coverage, split thickness skin graft, muscular flaps which are used to fill a cavity (e.g. ischiorectal space) are various options of reconstruction. Use of meshed skin, skin grafts for scrotal reconstruction and perineal wound cover are easy and quick options¹³. Infection, heavy fluid exudate and difficult site for graft stabilization are all causes of graft failure. The use of negative pressure dressing has been promoted recently¹⁴ and the vacuum assisted closure system has also been developed in which a pressure below atmosphere is applied to an open cell foam placed into the wound.

CONCLUSION

Fournier's gangrene is not common but life-threatening disease which needs radical debridement, effective antibiotics to control the infection and early reconstruction with skin graft and myocutaneous flaps. As the mortality is usually due to delayed diagnosis, therefore, minor injuries and infections should be given due attention.

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